West Beach Succession Trail

This one-mile trail will take you on a journey through time as well as space. Beginning on a bare sand beach and ending in an oak forest, it traces a process in nature that took thousands of years to evolve.

That process, called *succession*, is the means by which a group of plants and animals in a particular place is gradually replaced over time by other, sometimes very different, natural communities.

Although succession is now taught routinely in schools, it was a controversial new idea at the turn of the century when University of Chicago Professor Henry Chandler Cowles first brought his students here. Using the area as a natural laboratory to demonstrate how plant succession worked, he achieved worldwide recognition not only for himself but also for this sand dune country on the margin of Lake Michigan. Because of his work, the dunes became known as the birthplace of a science called *ecology*.

The National Park Service today is continuing to study natural dunes succession and has set aside for special observation several areas here in the park's West Unit. For this reason, visitors are asked to stay on the trail and to refrain from picking wildflowers or disturbing animal habitats.

Have a pleasant walk.

1

The Beach

Bare of all but sand and sunbathers, the beach seems an unlikely beginning stage for an oak-covered dune. Yet only a few thousand years ago, the shoreline was a mile inland, beyond the trail you're exploring today. As climates warmed and the lake receded, the plants and animals advanced, joining the wind and weather to change the shape and texture of the land.

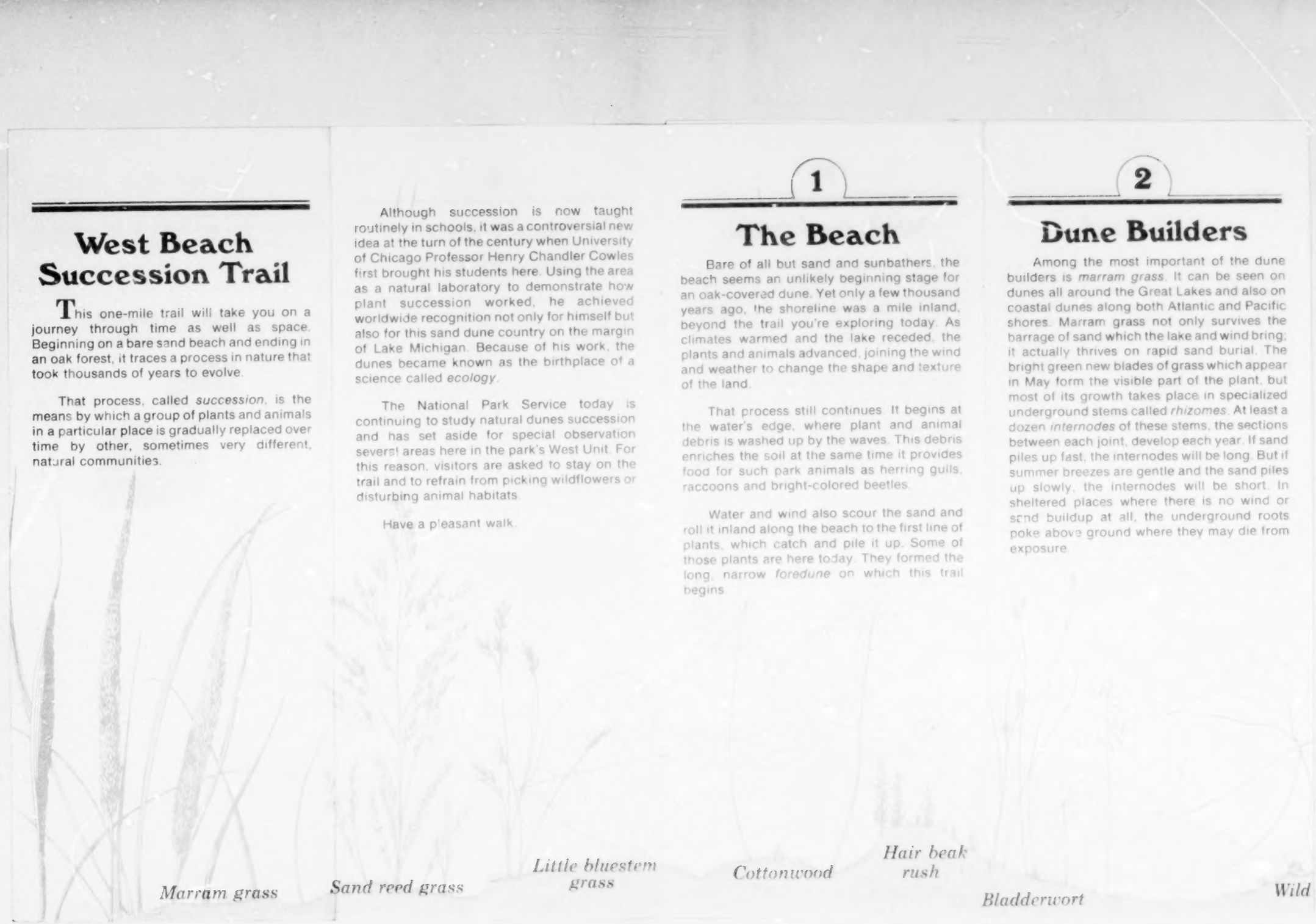
That process still continues. It begins at the water's edge, where plant and animal debris is washed up by the waves. This debris enriches the soil at the same time it provides food for such park animals as herring gulls, raccoons and bright-colored beetles.

Water and wind also scour the sand and roll it inland along the beach to the first line of plants, which catch and pile it up. Some of those plants are here today. They formed the long, narrow *foredune* on which this trail begins.

2

Dune Builders

Among the most important of the dune builders is *marram grass*. It can be seen on dunes all around the Great Lakes and also on coastal dunes along both Atlantic and Pacific shores. Marram grass not only survives the barrage of sand which the lake and wind bring; it actually thrives on rapid sand burial. The bright green new blades of grass which appear in May form the visible part of the plant, but most of its growth takes place in specialized underground stems called *rhizomes*. At least a dozen *internodes* of these stems, the sections between each joint, develop each year. If sand piles up fast, the internodes will be long. But if summer breezes are gentle and the sand piles up slowly, the internodes will be short. In sheltered places where there is no wind or sand buildup at all, the underground roots poke above ground where they may die from exposure.



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The rhizomes and roots of a single marram grass plant may spread up to 20 feet in all directions. A typical dune like the one along which you've just walked is held together beneath the surface with a dense network of these underground threads.

The *cottonwood* tree under which you're standing is another important dune builder. Unlike the grass, it needs a low, sheltered spot in order to sprout, but by the time it's a few feet tall, it can also survive and buildup.

As the tree's stems are buried, they begin to function as roots and new stems appear above ground. Although many of the cottonwoods on this trail appear short, some may actually be only the exposed tips of 60-foot-tall giants.

3

Intradunal Pond

The pool of water here behind the first dune appears tranquil now. Yet it, too, was created by the wind's violent force, carving a channel through a low spot between the dune and lake to scoop the sand out down to the water table.

Many of the plants and animals in and around the pool, called an *intradunal pond*, are different from those on the dune slopes but similar to those in other ponds west of the beachhouse. One of the animals found here, the *Fowler's Toad*, lays its eggs and passes its tadpole stage in the pond.

Rare flowers, like the insect eating *horned bladderwort* and the *Kalm's lobelia* grow along the pond edges.

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The Lee Side

From the top of this hill, you can see a new dune grass on the protected lee slopes and in the hollow behind the first dune ridge. It's called *little bluestem*, and in most seasons it is easy to spot from a distance because of a subtle change in color between its leaves and that of marram grass.

Little bluestem grass grows in dry areas, including sand prairies, throughout the Midwest. It can't build dunes, but it grows in thick sturdy clumps and can help hold the dunes in place once they're established. Other typical dune plants which grow here beyond the reach of the wind's main force are *sand cherries*, distinctive three-leaved *hop trees*, and an increasingly varied collection of wildflowers. Among the most typical are *sand cress* with its tiny white blossoms and yellow-flowered *puccoon*. Both bloom through most of the summer months.

As the plants die and decay, their remains produce a richer soil mixture. That, in turn, may produce an environment suitable for even greater varieties of trees, grass, shrubs, and wildflowers.

5

Jack Pines

This jack pine grove is another dune curiosity, growing in the National Lakeshore and along other Great Lakes dunes much farther south than the main part of its range. The first dune jack pine may have flourished here soon after the Ice Age, when the local climate was much cooler. The ground-hugging *bearberries* which thrive beneath the pines are another northern species.

6

Blowout

This steep-sided valley, called a *blowout*, demonstrates that the process of succession is not always an orderly one. In this case, it has moved backward. The blowout was formed when wind whistled in through a low spot in the dunes and carved out a depression.

Heavy human use has worn away more of the protective vegetation in recent years, so many of the plants you see here now are the same pioneer dune builders you saw on the first foredune above the beach. Cottonwood tree and marram grass roots are exposed alongside these stairs which climb up the blowout's south slope.

A *tree graveyard* can also be seen west of the stairs. Tree graveyards are the blackened remains of trees once buried by sand and now re-exposed as the mass of that sand, called a *wandering dune*, moves on. Because burial in the sand has slowed decomposition, some of the trees are still standing and most retain their original shape.

7

Wooded Dune

In summer, the temperature in these woods is often as much as 10 degrees lower than on the open slope on which you just walked. Most of the tallest or *canopy* trees here are black oaks, but there are also hickories, basswoods, and ashes.

Beneath the tall oaks are slimmer sassafras and dogwoods, witch hazel shrubs and ironwood trees. The variety indicates that this dune is far enough from the lake to be protected from wind and winter storms. It also is a sign that the dune is very old by local standards, at least 2,000 years and probably more.

Succession here, too, can still be reversed. Human activity in recent years has increased the movement of sand from the open dune downslope into the forest.

8

Sandmine Succession

The flat landscape which stretches west from this stairway once contained rolling dunes like the ones over which you've just hiked. They were leveled and hauled away by sandminers before this area was a park.

Because no new sand has been taken from this site for many years now, it too has begun a process of succession. Small mounds of sand are building here and there, while marram grass, little bluestem grass and sand cherry shrubs are becoming more common. With National Park Service protection and respect for the land by visitors, this, too, may someday become a spectacular dune again.

We hope you have enjoyed your walk through time and that you will explore an Indiana Dunes National Lakeshore trail again soon.

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